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Description:

The Model 4AD Analog/Digital Stimulus Isolation Amplifier (SIU) is a low-noise optical isolation amplifier design to optically isolate electrical stimulating currents.

Highlights:

Operates as BOTH a digital and a linear isolator, ZERO leakage current, high compliance (135VDC), ZERO power on spikes (maintains short circuit across electrode when off), low battery indicator, voltage or current output, good step response, biphasic.

Theory of Operation:

Inputs: The input mode is either analog (linear) or digital. In the analog/linear mode the output current level is proportional to the amplitude of the input voltage signal. Analog Input range is 0-10V. A negation switch allows negative input voltages. Digital input is TTL and CMOS compatible. Both inputs are BNC and are selectable with a toggle switch on the front panel or via digital control.

Output: Output is either a current source or a voltage source (set by a toggle switch). Therefore unit operates as a Voltage Controlled Current Source (VCCS) or a Voltage Controlled Voltage Source (VCVS). The output polarity can be set to allow biphasic operation in the digital mode. Output connector is BNC and the mode (current or voltage), along with the polarity (+ or -) is selectable with a toggle switch on the front panel.

Range: Four output ranges are 0-0.01mA, 0-0.1mA, 0-1mA or 0-10mA. In Analog mode the output range is directly proportional to an input range of 0 to 10V (or -10V to 0). e.g. when range is 0-1mA an input sine wave whose peak to peak voltage ranges from 0-6V will produce an output current sine wave of 0-0.6mA. In the Digital mode the output is adjust with a 10-turn potentiometer where the value of the pot reflects the value of the output current when a digital pulse is applied. e.g. when the range is 0-1mA and the pot is set at 6 turns the output current will be 0.6mA during the time that the digital input is at a "high" logic level.

Power: Powered by 20x 9 Volt alkaline batteries.

Dual Mode Stimulus Isolation Amplifier Specifications

Input impedance	Analog mode => 20Mohm // 2 pF min Digital mode => N/A
Input voltage range	Analog mode => 0 V to 10V or -10V to 0V Digital mode => TTL/CMOS (0 to 5V)
Gain	Analog mode => 0.001mA/V, 0.01mA/V, 0.1mA/V, 1mA/V Digital mode => Adjustable in the ranges; 0-0.01mA, 0-0.1mA, 0-1mA, 0-10mA
Output	Double-ended, isolated from ground, either voltage or current.
Output Compliance	135VDC
Step response	<10 μ S (digital mode, output 5mA, load = 1Kohm). Rise time is highly a function of load and output current level.
Leakage current	ZERO
Isolation	2500 Volts (optical)
Dimensions	7.25" x 2.5" x 9"
Other features	Output indicator (lights when output sourcing current or voltage). Low battery indicator with load test. Rack mount option.

Quote requests, orders and technical support:

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